

Extracting Fruit and Vegetable DNA

Procedure:

1. Place cut piece of fruit or vegetable in large tube.
2. Add DNA extraction buffer to the 2 mL mark.
3. Use 2 wooden sticks to mince the fruit or vegetable. Mash well. Keep one stick.
4. Let the tube sit for about 2 minutes to let the pieces of fruit or vegetable settle to the bottom.
5. Carefully remove 1 mL of liquid extract and transfer to small tube (Do not transfer pieces of fruit or vegetable).
6. Carefully overlay extract with 1 mL of freezer-cold isopropyl alcohol by letting it gently run down the side of the tube.
7. Use a wooden stick to “spool” or wrap the DNA around the stick by gently rotating the stick at the interface of the extract and the alcohol.
8. Remove the stick to observe the DNA (viscous, gelatinous mass).

Background:

- DNA extraction = pull the DNA out of the nuclei of the cell
- Aqueous buffer = water based with a specific pH
 - Salt in the extraction buffer allows us to see the long strands of DNA because DNA is normally really tightly wound around proteins
 - The salt breaks the bonds between the DNA and proteins, allowing it to unwind
- Precipitation = making it become visibly solid
 - With alcohol in the presence of salt
- DNA is soluble (dissolves) in water and cannot be seen
- DNA is insoluble (cannot dissolve) in alcohol, forming white fibers
- Rubbing alcohol has a lower density than water, so it forms a second layer above the DNA solution
- Amount of DNA spooled is a consequence of the length of the DNA fragments
- Can be done with other organisms by breaking open the cells and precipitating the DNA
 - For fruit flies, whole flies are ground up in a tube with extraction buffer then precipitated with ethanol
- After the extraction, genes can be analyzed through PCR